STATE OF CALIFORNIA

AIR RESOURCES BOARD

AIR MONITORING QUALITY ASSURANCE

VOLUME V

AUDIT PROCEDURES MANUAL FOR AIR QUALITY MONITORING

APPENDIX AE

SITE SURVEY PROGRAM FOR AMBIENT AIR MONITORING STATIONS

MONITORING AND LABORATORY DIVISION

AUGUST 2002

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APPENDIX AE.1

SITE SURVEY PROGRAM FOR AMBIENT AIR MONITORING STATIONS

MONITORING AND LABORATORY DIVISION

AUGUST 2002

AE.1.0 INTRODUCTION

To generate accurate and representative data, air monitoring stations are required to meet regulatory siting requirements and conditions. A detailed analysis of siting conditions, as reported during the site surveys at the sites, allows a determination of whether the data from ambient air monitoring stations meets the United States Environmental Protection Agency (U.S. EPA) and Air Resources Board (ARB) siting criteria.

AE.1.0.1 BACKGROUND

The general assumption is that stations met the siting criteria at the time they initiated operation. Subsequent non-conformance with site requirements today results from changing regulations and changes in surrounding conditions or land use. The siting requirements of the ARB's Quality Assurance (QA) Manual Volume II; (U.S. EPA's) 40 CFR 58, Appendix E; U.S. EPA's Quality Assurance Handbook Volume IV; U.S. EPA's Prevention of Significant Deterioration (PSD); and U.S. EPA's Photochemical Assessment Monitoring Stations (PAMS) guidelines, contain the specific siting criteria to ensure the collection of accurate and representative data.

Some of the U.S. EPA's siting criteria are stated as "must meet" and some are stated as "should meet". According to 40 CFR 58, Appendix E the "must meet" requirements are necessary for data to meet "data-for-record" requirements. Any exception from the "must meet" requirements must be formally approved through the Appendix E waiver provision (Section 11). The "should meet" criteria establish a goal for data consistency.

AE.1.0.2 SITING CRITERIA

The siting criteria for each pollutant vary depending on the pollutant's properties and the requirements addressed in the guideline documents. In the accompanying tables (Tables AE.1.0.1 - AE.1.0.13), the impact and effect on data representativeness or accuracy of violating siting criteria is briefly described. The impact of deviation from the siting criteria has been deduced from the aspects of air monitoring that would be influenced by the deviation. Likewise, the effect of the deviation has been deduced from whether the deviation would influence the representativeness (e.g., accurately monitoring an air mass, but the air mass monitored may not be the one desired) and accuracy (e.g., the monitors are not

properly sampling the air mass). The U.S. EPA status (must/should) is also listed. The sources of the pertinent rules are listed under the "Rule" heading. A rule from the U.S. EPA's 40 CFR 58, Appendix E, is abbreviated as "E Rule-Number", (i.e., a criterion found in the U.S. EPA's 40 CFR 58, Appendix E, Section 8.1 is abbreviated as E8.1). A siting criterion found in the ARB's QA Manual, U.S. EPA's QA Handbook Volume IV, U.S. EPA's PSD, and PAMS guidelines are abbreviated as QA II, Volume IV, PSD, and PAMS, respectively. The final column of the tables describes whether an Air Quality Data Action (AQDA) request or warning should be issued.

In Table AE.1.0.1, the various particulate matter sampler types, PM2.5, PM10 (SSI), dichot, TEOM, BAM, AISI, and nephelometer are grouped together since they are all different ways of measuring the same pollutant. Similarly, lead and TSP are grouped in Table AE.1.0.2 since lead is analyzed on the TSP fraction.

Tables AE.1.0.3 through AE.1.0.6 address ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) siting criteria, respectively.

Table AE.1.0.7 addresses the siting criteria for hydrogen sulfide (H_2S) monitoring. Siting criteria for SO_2 were used for H_2S monitoring as a compromise since no criteria exists specifically for H_2S monitoring. Since there are no specific siting criteria for H_2S monitoring, a warning is appropriate for most siting discrepancies, except those effecting accuracy. The probe material, residence time, in-line filter, and station temperature effect the accuracy of the data collected, therefore an AQDA will be issued for violations. Siting criteria for total hydrocarbons (THC), methane (CH_4), and non-methane hydrocarbons (NMHC) are based on PAMS guidelines and 40 CFR 58, Appendix E requirements. They are also included with PAMS in Table AE.1.0.8. Criteria for toxics (gaseous; XonTech 910, 910A), Table AE.1.0.9, and toxics (particulate XonTech 920), Table AE.1.0.10, are based on requirements from the ARB QA Manuals.

Meteorological monitoring (temperature, relative humidity, wind speed, wind direction, and solar radiation (Tables AE.1.0.11- AE.1.0.13) siting criteria are based on PAMS siting conditions specified in the U.S. EPA QA Handbook Volume IV, and the ARB QA Manual. Many of these criteria are also the same as listed in the U.S. EPA's PSD guidelines. A table was not generated for barometric pressure since it is relatively immune to siting conditions, and no siting specifications were available.

AIR MONITORING SITING CRITERIA

TABLE AE.1.0.1 Parameter: PM2.5, PM10 (SSI), Dichot, TEOM, BAM, AISI, Nephelometer

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	Possible contamination	Representativeness	Should	E8.1	Warning***
Height	Spatial regime sampled	Representativeness	Must	E8.1	AQDA
Spacing Between Samplers	Spatial regime/interference	Accuracy	Must	A3.3	AQDA
Boom Length					
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness	Must	E8.2	AQDA
Tree Dripline	Destructive interference	Accuracy	Should/Must*	E8.2	AQDA
Wall, Parapets, Etc.	Spatial regime/airflow	Representativeness	Must	E8.2	AQDA
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E8.2	AQDA
Local Sources	Possible contamination	Representativeness	Should	E8.2	Warning***
Flues	Possible contamination	Representativeness	Should	E8.2	Warning***
Traffic	Spatial scale**	Representativeness	Must	E8.3	AQDA
Probe Material					
Probe Residence Time					
Inline Filter					
Station Temperature					

* Should be 20 meters from general dripline of trees, must be 10 meters from dripline if the tree is considered to be an obstacle.

** Acceptable distance from traffic is related to volume of traffic and scale of monitoring (See Figure 2; 40 CFR 58, Appendix E).

*** All warnings are verbal at this time.

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.2 Parameter: Lead, TSP

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	Possible contamination	Representativeness	Should	E7.1	Warning***
Height	Spatial regime sampled	Representativeness	Must	E7.1	AQDA
Spacing Between Samplers	Spatial regime/interference	Accuracy	Must	A3.3	AQDA
Boom Length					
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness	Must	E7.2	AQDA
Tree Dripline	Destructive interference	Accuracy	Should/Must*	E7.4	AQDA
Wall, Parapets, Etc.	Spatial regime/airflow	Representativeness	Must	E7.2	AQDA
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E7.2	AQDA
Local Sources	Possible contamination	Representativeness	Should	E7.2	Warning***
Flues	Possible contamination	Representativeness	Should	E7.2	Warning***
Traffic	Spatial scale**	Representativeness	Must	E7.3	AQDA
Probe Material					
Probe Residence Time					
Inline Filter					
Station Temperature					

* Micro and middle scale category (a) sites - Must be no trees between source and sampler. Neighborhood scale category (b) sites – Should be 20 meters from general dripline and must be at least 10 meters from trees that act as obstructions.

** Acceptable distance from traffic is related to volume of traffic and scale of monitoring (see Figure 2; 40 CFR 58, Appendix E).

*** All warnings are verbal at this time.

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.3 Parameter: O_3

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover					
Height	Spatial regime sampled	Representativeness	Must	E5.1	AQDA
Spacing Between Samplers					
Boom Length	Spatial regime/airflow	Representativeness	Must	E5.1	AQDA
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness	Must	E5.2	AQDA
Tree Dripline	Destructive interference	Accuracy	Should/Must*	E5.4	AQDA
Wall, Parapets, Etc.					
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E5.2	AQDA
Local Sources	Destructive interferences (NOx sources)	Representativeness	Should	E5.3	AQDA
Flues	(Considered local sources)				
Traffic	Destructive interference**	Accuracy	Should**	E5.3	AQDA
Probe Material	Destructive interference	Accuracy	Must	E9	AQDA
Probe Residence Time	Destructive interference	Accuracy	Must	E9 & QA II	AQDA
Inline Filter	Operation	Accuracy		QA II	AQDA
Station Temperature	Operation	Accuracy		QA II	AQDA

* Should be 20 meters from general dripline of trees, must be 10 meters from dripline in the direction of city center and along summer daytime wind direction.

** Acceptable distance from traffic is related to volume of traffic and scale of monitoring (See Figure 2; 40 CFR 58, Appendix E).

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.4 Parameter: CO

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover					
Height	Spatial regime sampled*	Representativeness	Must	E4.1	AQDA
Spacing Between Samplers					
Boom Length	Spatial regime/airflow	Representativeness	Must	E4.1	AQDA
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness	Must	E4.2	AQDA
Tree Dripline	Spatial regime/airflow**	Representativeness	Should/Must**	E4.4	**
Wall, Parapets, Etc.					
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E4.2	AQDA
Local Sources					
Flues					
Traffic	Spatial scale***	Representativeness	Must	E4.3	AQDA
Probe Material	Destructive interference	Accuracy	Must	E9	AQDA
Probe Residence Time	Destructive interference	Accuracy	Must	E9 & QA II	AQDA
Inline Filter	Operation	Accuracy		QA II	AQDA
Station Temperature	Operation	Accuracy		QA II	AQDA

* Height of inlet depends on scale of monitoring (see 40 CFR 58 Appendix E, Section 4.0).

** Middle and Neighborhood scale - trees should not be between CO source and sampler - Warning.

\- Must be at least 10 meters from trees that extend at least 5 meters above sampler and are in the direction of the road - AQDA.

Microscale - no trees should be located between the sampler and the road - Warning.

Rule #.# - Rule found in 40 CFR 58, Appendix E, Section #.#; QA II - Rule found in ARB QA Manual Volume II.

All blank spaces on table are not applicable.

*** Acceptable distance from traffic related to volume of traffic and scale of monitoring (see Table1; 40 CFR 58, Appendix E).

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.5 Parameter: NO_2

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover					
Height	Spatial regime sampled	Representativeness	Must	E6.1	AQDA
Spacing Between Samplers					
Boom Length	Spatial regime/airflow	Representativeness	Must	E6.1	AQDA
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Destructive interference	Accuracy	Must	E6.2	AQDA
Tree Dripline	Destructive interference	Accuracy	Should/Must*	E6.4	AQDA
Wall, Parapets, Etc.					
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E6.2	AQDA
Local Sources					
Flues					
Traffic	Spatial scale**	Representativeness	Must	E6.3	AQDA
Probe Material	Destructive interference	Accuracy	Must	E9	AQDA
Probe Residence Time	Destructive interference	Accuracy	Must	E9 & QA II	AQDA
Inline Filter	Operation	Accuracy		QA II	AQDA
Station Temperature	Operation	Accuracy		QA II	AQDA

* Should be 20 meters from general dripline. For individual trees that protrude above the height of the probe by 5 meters or more, the sampler must be at least 10 meters from the dripline.

** Acceptable distance from traffic related to volume of traffic and scale of monitoring (see Table 3; 40 CFR 58, Appendix E).

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#; QA II - Rule found in ARB QA Manual Volume II.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.6 Parameter: SO_2

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	Possible contamination	Representativeness	Must	E3.1	AQDA
Height	Spatial regime sampled	Representativeness	Must	E3.1	AQDA
Spacing Between Samplers					
Boom Length	Spatial regime/airflow	Representativeness	Must	E3.1	AQDA
Boom Position					
Boom Orientation	Spatial regime/airflow	Representativeness	Should	E3.1	Warning**
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness	Must	E3.2	AQDA
Tree Dripline	Destructive interference	Accuracy	Should/Must*	E3.3	AQDA
Wall, Parapets, Etc.	Spatial regime/airflow	Representativeness	Must	E3.2	AQDA
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E3.2	AQDA
Local Sources	Possible contamination	Representativeness	Should	E3.2	Warning**
Flues	Possible contamination	Representativeness	Should	E3.2	Warning**
Traffic					
Probe Material	Destructive interference	Accuracy	Must	E9	AQDA
Probe Residence Time	Destructive interference	Accuracy	Must	E9 & QA II	AQDA
Inline Filter	Operation	Accuracy		QA II	AQDA
Station Temperature	Operation	Accuracy		QA II	AQDA

* Should be 20 meters from general dripline of trees, must be 10 meters from dripline if tree is considered to be an obstacle.

** All warnings are verbal at this time.

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#; QA II - Rule found in ARB QA Manual Volume II.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.7 Parameter: H_2S

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	Possible contamination	Representativeness			Warning*
Height	Spatial regime sampled	Representativeness			Warning*
Spacing Between Samplers					
Boom Length	Spatial regime/airflow	Representativeness			Warning*
Boom Position					
Boom Orientation	Spatial regime/airflow	Representativeness			Warning*
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness			Warning*
Tree Dripline	Destructive interference	Accuracy			AQDA
Wall, Parapets, Etc.	Spatial regime/airflow	Representativeness			Warning*
Air Flow Arc	Spatial regime/airflow	Representativeness			Warning*
Local Sources	Possible contamination	Representativeness			Warning*
Flues	Possible contamination	Representativeness			Warning*
Traffic					
Probe Material	Destructive interference	Accuracy		E9 & QA II	AQDA
Probe Residence Time	Destructive interference	Accuracy		E9 & QA II	AQDA
Inline Filter	Operation	Accuracy		QA II	AQDA
Station Temperature	Operation	Accuracy		QA II	AQDA

*** All warnings are verbal at this time.**

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#; QA II - Rule found in ARB QA Manual Volume II.

All blank spaces on table are not applicable.

TABLE AE.1.0.8 Parameter: CH_4, THC, NMHC, PAMS

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover					
Height	Spatial regime sampled	Representativeness	Must	E10.1 & PAMS	AQDA
Spacing Between Samplers					
Boom Length	Spatial regime/airflow	Representativeness	Must	E10.1 & PAMS	AQDA
Boom Position					
Boom Orientation	Spatial regime/airflow	Representativeness	Must	E10.2 & PAMS	AQDA
Radiation Shield					
Obstacles	Spatial regime/airflow	Representativeness	Must	E10.2 & PAMS	AQDA
Tree Dripline	Destructive interference	Accuracy	Should/Must*	E10.4 & PAMS	AQDA
Wall, Parapets, Etc.					
Air Flow Arc	Spatial regime/airflow	Representativeness	Must	E10.2 & PAMS	AQDA
Local Sources	Contamination/Interference	Representativeness	Must	E10.3 & PAMS	AQDA
Flues	(Considered obstacles)				
Traffic	Contamination/Interference**	Representativeness	Must	E10.3 & PAMS	AQDA
Probe Material	Destructive interference	Accuracy		E9 & QA II	AQDA
Probe Residence Time	Destructive interference	Accuracy		E9 & QA II	AQDA
Inline Filter	Operation	Accuracy		QA II	AQDA
Station Temperature	Operation	Accuracy		QA II	AQDA

*** Should be 20 meters from general dripline of trees, must be 10 meters from dripline in direction of urban core or other areas of maximum ozone precursors in the direction of the predominant winds.**

**** Acceptable distance from traffic is related to the volume of traffic and scale of monitoring (see Table 2.2; PAMS).**

Rule PAMS - Rule found in Photochemical Assessment Monitoring Stations Guidelines, Section 2.3.3;

QA II – Rule found in QA Manual Volume II.

Rule E#.# - Rule found in 40 CFR 58, Appendix E, Section #.#.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.9 Parameter: Toxics (gaseous; XonTech 910, 910A)

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover					
Height	Spatial regime sampled	Representativeness		QA II	Warning*
Spacing Between Samplers					
Boom Length					
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Interference/Contamination	Accuracy		QA II	AQDA
Tree Dripline	(Considered obstacles)	Accuracy		QA II	AQDA
Wall, Parapets, Etc.	Spatial regime sampled	Representativeness		QA II	Warning*
Air Flow Arc	Spatial regime sampled	Representativeness		QA II	Warning*
Local Sources	Possible contamination	Representativeness		QA II	Warning*
Flues	Possible contamination	Representativeness		QA II	Warning*
Traffic	Possible contamination	Representativeness		QA II	Warning*
Probe Material	Interference	Accuracy		QA II	AQDA
Probe Residence Time	Interference	Accuracy		QA II	AQDA
Inline Filter	Operation	Operation		QA II	Warning*
Station Temperature	Operation	Accuracy		QA II	AQDA

* All warnings are verbal at this time.

QA II – Rule found in ARB QA Manual Volume II.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.10 Parameter: Toxics (particulate XonTech 920)

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	Possible contamination	Representativeness		QA II	Warning*
Height	Spatial regime sampled	Representativeness		QA II	Warning*
Spacing Between Samplers	Spatial regime and interference	Accuracy		QA II	AQDA
Boom Length					
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Spatial regime /airflow	Representativeness		QA II	Warning*
Tree Dripline	Destructive interference	Accuracy		QA II	AQDA
Wall, Parapets, Etc.	Spatial regime/airflow	Representativeness		QA II	Warning*
Air Flow Arc	Spatial regime/airflow	Representativeness		QA II	Warning*
Local Sources	Possible contamination	Representativeness		QA II	Warning*
Flues	Possible contamination	Representativeness		QA II	Warning*
Traffic	Possible contamination	Representativeness		QA II	Warning*
Probe Material					
Probe Residence Time					
Inline Filter					
Station Temperature					

*** All warnings are verbal at this time.**

QA II – Rule found in ARB QA Manual Volume II.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.11 Parameter: Temperature and Relative Humidity

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	Interference	Accuracy	Must	Vol. IV, QA II	AQDA
Height	Spatial regime sampled	Representativeness	Should	Vol. IV, QA II	Warning*
Spacing Between Samplers					
Boom Length	Interference	Accuracy	Must	Vol. IV, QA II	AQDA
Boom Position	Interference	Accuracy	Should	Vol. IV, QA II	AQDA
Boom Orientation	Interference	Accuracy	Should	Vol. IV, QA II	AQDA
Radiation Shield	Interference	Accuracy	Should	Vol. IV, QA II	AQDA
Obstacles	Spatial regime sampled	Representativeness	Should	Vol. IV, QA II	Warning*
Tree Dripline	(Considered obstacles)				
Wall, Parapets, Etc.	(Considered obstacles)				
Air Flow Arc	(Considered obstacles)				
Local Sources	Interference	Representativeness		Vol. IV, QA II	Warning*
Flues	Interference	Representativeness		Vol. IV, QA II	Warning*
Traffic					
Probe Material					
Probe Residence Time					
Inline Filter					
Station Temperature					

* All warnings are verbal at this time.

QA II – Rule found in ARB QA Manual Volume II.

Vol. IV – Rule found in the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV.

All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.12 Parameter: Wind Speed and Direction

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover	*				
Height	Spatial regime sampled	Representativeness	Should	PSD, Vol. IV, QA II	Warning**
Spacing Between Samplers					
Boom Length	Interference	Accuracy	Should	PSD, Vol. IV, QA II	AQDA
Boom Position	Interference	Accuracy	Should	PSD, Vol. IV, QA II	AQDA
Boom Orientation	Interference	Accuracy	Should	PSD, Vol. IV, QA II	AQDA
Radiation Shield					AQDA
Obstacles	Interference	Accuracy	Should	PSD, Vol. IV, QA II	AQDA
Tree Dripline	(Considered obstacles)				
Wall, Parapets, Etc.	(Considered obstacles)				
Air Flow Arc	Interference	Accuracy	Should	QA II	AQDA
Local Sources					
Flues					
Traffic					
Probe Material					
Probe Residence Time					
Inline Filter					
Station Temperature					

* Avoid complex terrain.

** All warnings are verbal at this time.

PSD - Rule found in the U.S. EPA Ambient Monitoring Guidelines for Prevention of Significant Deterioration.

Vol. IV -Rule found in the U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV.

QA II -Rule found in the ARB QA Manual Volume II.
All blank spaces on table are not applicable.

AIR MONITORING SITING CRITERIA (cont'd.)

TABLE AE.1.0.13 Parameter: Solar Radiation

Item	Impact	Effect	U.S. EPA Status	Rule	Action
Ground Cover					
Height					
Spacing Between Samplers					
Boom Length					
Boom Position					
Boom Orientation					
Radiation Shield					
Obstacles	Interference	Representativeness	Should	Vol. IV, QA II	Warning**
Tree Dripline					
Wall, Parapets, Etc.	(Considered obstacles)				
Air Flow Arc					
Local Sources*	Interference	Representativeness	Should	Vol. IV, QA II	Warning**
Flues					
Traffic					
Probe Material					
Probe Residence Time					
Inline Filter					
Station Temperature					

* Light colored walls, reflective surfaces, lights.

** All warnings are verbal at this time.

Vol. IV – Rule found in U.S. EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV.

QA II – Rule found in the ARB QA Manual Volume II.

All blank spaces on table are not applicable.

AE.1.1 WAIVER OPTIONS

A waiver of 40 CFR 58, Appendix E criteria may be requested from U.S. EPA Region IX by the ARB; however, the U.S. EPA will not lightly grant waivers. Requests for a waiver must be very well documented, emphasizing why the criteria cannot be met and demonstrating that the data are representative of monitoring objectives. Cost benefits, historical trends, etc., can be weighed as factors, but cannot be the sole reason for the waiver.

The U.S. EPA evaluates each request, taking into account the effect the deviation has on the measurements, especially to the pollutants of primary concern at a monitoring site. For example, if a siting factor for particulate matter is not met, but the primary purpose of the site is to monitor SO_2 concentrations, the U.S. EPA will be more amenable to a waiver of the particulate matter siting criterion. The U.S. EPA will also consider the impact of wind direction on pollutant concentrations when considering a waiver. A site must be free of impairments in the windward direction of pollutant sources.

The U.S. EPA tends to be more lenient about approving a waiver if a pollutant concentration is consistently well above or well below the ambient air quality standards. After a site is issued a waiver, the waiver will be reevaluated if the concentrations begin to be close to the standard and could be a factor in attainment/non-attainment designations.

AE.1.2 IMPLEMENTATION

The QAS needs to walk a fine line between accepting non-representative data and possibly deleting years worth of data. At this point, an AQDA should be issued for not meeting "must meet" criteria and a warning for not meeting the "should meet" criteria. In addition, any siting conditions adversely influencing the accuracy of the data should result in an AQDA. If a siting factor only impacts representativeness, it should result in a warning, rather than an AQDA, unless the item carries an U.S. EPA "must meet" classification. The attached tables delineate the site survey items, their potential impact and effect, whether the item is an U.S. EPA "must meet" or "should meet" item, and whether noncompliance should result in an AQDA or a warning.

The QAS issues AQDAs or warnings to correct all siting deficiencies. If an AQDA or warning is not issued, corrective action is probably unlikely to be forthcoming. However, the QAS does not want to disrupt monitoring projects unnecessarily in order to correct minor siting criteria conditions.

The conditions resulting in the AQDA or warning, and the corrective action taken, should be coordinated with the appropriate air monitoring section. If the corrective action entails relocation or reclassification of the station, it should also be coordinated with the ARB's Planning and Technical Support Division. Copies of the Site Survey are currently being forwarded to the air monitoring sections for their information.

In staff discussions with the U.S. EPA, the U.S. EPA has expressed the desire to do everything possible to preserve data while maintaining the quality of the data acquired. The above procedures would assure the ambient air monitoring stations are up to conformance with the siting criteria. New stations would be required to meet all criteria before their data are accepted.

AE.1.2.1 SITE REPORTS

The information from site reports generated by monitoring staff for site initiations or modifications will be entered into a new site survey record, or appended to any existing site survey record. The information will be evaluated and discussed with the site operator. If necessary, an AQDA or warning will be issued. If information is added to a site survey from a site report amendment, the items entered will be noted under action items to be checked and confirmed in the field.

AE.1.2.2 SITE REVIEWS

A site review consists of field review and verification of siting conditions. These data are entered, confirmed, or updated in the ARB Site Survey Report (Figure AE.1.2.1). If there is no site survey on file, the site review will entail collecting and entering all information and measurements about a site. If a partial site survey is on file (for example, data entered from the site report), the site review will entail review and confirmation of existing data, and augmentation with the remaining required data. Any discrepancies in the information from the site reports will be noted in the comments section. Such discrepancies will be investigated to establish the correct information. If necessary, the site operator will be requested to submit an amended site report.

If there is a complete site survey on file, the information and measurements will be reviewed and confirmed for continued accuracy. Any changes will be noted on the site survey form, and annotated in the comments section. Discrepancies from siting criteria will be noted in the action items section. Discrepancies from the siting criteria will be evaluated and an AQDA or warning issued if necessary.

AE.1.2.3 AQDA/WARNING ISSUANCE

If necessary, AQDAs and warnings will be issued for deficiencies noted in the site reviews, or reviews of site reports. If a siting criteria deficiency is found during review of the site report for a new or modified monitoring station, the deficiency will be discussed with the site operator. If the site operator confirms the siting criteria deficiency, they will be informed of the impact of the deficiency on data quality and advised to correct the problem. Data will not be accepted from a new station that does not meet siting criteria.

In the case where a siting criteria deficiency is found during a site review, the site operator will be informed of the deficiency at the time it is found. The conditions not meeting the siting criteria will be discussed with the operator. The operator will also be informed whether the deficiency is an AQDA or warning item.

If an AQDA level deficiency is found at the site, the auditors will confirm that the condition requires an AQDA when they return to the office, and the QA section manager will be informed of the intent to issue the AQDA. The AQDA will be logged, assigned a tracking number, and an AQDA letter will be generated for the QA section manager's signature.

If a warning level siting criteria deficiency is found at the site, the auditors will confirm that the condition requires a warning and notify the operator of the condition and the impact on data quality. At this time, warnings are only verbal, no written warning is issued.

Site Survey Report

Siting Information

Site Name:	Audit Date:	Latitude:	Site Report:
ARB Number:	Auditors:	Longitude:	Site Photos:
AIRS Number:	Site Contact:	Elevation (m):	
Operating Agency:	Site Phone:		

General Siting Conditions

Station Temperature	**Traffic**	**Topography**	Predominant Wind Direction:
Controlled:	Description:	Site:	Arc Air Flow (Deg):
Recorded:	Distance:	Region:	Probe Clean:
Inside Temp:	Count (Veh/Day):	**QA Manual**	Manifold Clean:
Meteorology	**Non-vehicular Local Sources**	Approved:	Cleaning Schedule:
Located With Instruments:	Description:	Agency:	Autocalibrator Type:
Shadowing:	Distance:	Urbanization:	Site Survey Complete:
Boom Orientation (Deg):	Direction:	Ground Cover:	Logbook Up To Date:
Temp(Motor/Natural):			

Action Items

Figure AE.1.2.1
ARB Site Survey Report

SITE SURVEY REPORT (CONT.)

Instrument	Manufacturer/Model	Not For Rec.*	Purpose	Objective	Scale	Height Above		Sampler Spacing	Manual Available	Instrument Log. Maint'd. & Avail.	In-line Filter Change Date	Cal. Gas Cert Date
						Ground	Platform					
O3												
SO2												
NO2												
CO												
H2S												
CH4/THC												
NMHC												
PM10												
PM10 Colloc.												
PM10 Partisol												
PM10 Partisol Colloc.												
PM10 BAM												
PM10 BAM Colloc.												
PM2.5												
PM2.5 Colloc.												
PM2.5 BAM												
PM2.5 BAM. Colloc.												
PM2.5 Spec.												
TSP												
TSP Colloc.												
Dichot												
TEOM												
Temp.												
WS Horiz.												
WS Vertical												
WD												
%RH												
Baro.												
Solar												
NMOC 910 (3hr.)												
Toxics 910 (24hr.)												
Toxics 920 (flow)												
Carbonyl 925												

*Not For Rec. Data collected for informational purposes only and not entered into the U.S. EPA's AIRS.

Figure AE.1.2.1
ARB Site Survey Report (cont.)

SITE SURVEY REPORT (CONT.)

Instrument	Calibration		Cal. Equip. Cert. Date	Description of Obstacle	Dist./Direct. To Obstacle	Height above Inlet	Distance to Walls, etc.	Distance to Dripline	Dominant Influence	Residence Time (sec.)
	Current	Cal. Date								
O3										
SO2										
NO2										
CO										
H2S										
CH4/THC										
NMHC										
PM10										
PM10 Colloc.										
PM10 Partisol										
PM10 Partisol Colloc.										
PM10 BAM										
PM10 BAM Colloc.										
PM2.5										
PM2.5 Colloc.										
PM2.5 BAM										
PM2.5 BAM Colloc.										
PM2.5 Spec.										
TSP										
TSP Colloc.										
Dichot										
TEOM										
Temp.										
WS Horiz.										
WS Vertical										
WD										
%RH										
Baro.										
Solar										
NMOC 910 (3hr.)										
Toxics 910 (24hr.)										
Toxics 920 (flow)										
Carbonyl 925										

Figure AE.1.2.1
ARB Site Survey Report (cont.)

AE.1.2.4 AQDA RESOLUTION

The action necessary to resolve a siting criteria AQDA can be as simple as trimming trees, raising the inlet height, or increasing the probe flow rate; or as extensive as complete renovation or relocation of the monitoring station. In many cases, an amended site report will be required.

An amended site report will serve as documentation of corrective action taken to resolve a siting criteria AQDA. As with all information from site reports, the amended site report data will need to be checked by site review during the next audit or reaudit.

Since the QAS has not been enforcing the siting requirements and is primarily interested in correcting deficiencies, data deletion should be examined on a case-by-case basis. If an AQDA is issued and no corrective action is taken, the QAS should begin data deletion at the date at which it can be shown that the non-conforming condition began.

In some cases, such as in separation distance from traffic, the station operator may opt to change the category or scale description of the station to meet the requirements. Whether this is allowed under the State Implementation Plan (SIP) or other monitoring plans must be determined by the agency operating the site before requesting the change.

As a third alternative, a waiver could be applied for under 40 CFR 58, Appendix E, Section 11. A waiver approval by the U.S. EPA depends on how sensitive the monitoring is to the non-complaint condition, the reason monitoring is being conducted, and the ambient concentration levels relative to the ambient air quality standards. The U.S. EPA would prefer the condition be corrected rather than the requirement waived; therefore, the U.S. EPA does not readily grant waivers. However, the U.S. EPA wants to preserve data if at all possible.

AE.1.2.5 WARNING RESOLUTION

Resolution of warnings will be similar to the resolution of AQDAs, except data deletion will not be involved. The actions necessary by the site operator are the same. Corrective action will be requested when discussing the warning condition with the operator. The final audit report letter to the agency will also request a response detailing the action taken to correct the condition.